

Customer No.: 31561
Docket No.: 12295-US-PA
Application No.: 10/711,445

REMARKS

Claim Rejections – 35 U.S.C. § 103

The Office Action rejected claims 1-12 under 35 U.S.C. 103(a) as being unpatentable over Shin US 6,165,842 in view of Ueda US 6,090,666.

In response to the rejection to claims 1-12 under 35 U.S.C. 103(a) as being unpatentable over Shin US 6,165,842 in view of Ueda US 6,090,666, Applicants hereby otherwise traverse this rejection. As such, Applicant submits that claims 1-12 are in condition for allowance.

With respect to claim 1, as originally filed, recites in part:

A method for fabricating a flash memory device, comprising:

... performing a thermal oxidation process so that a portion of the charge storage layer is oxidized to form an inter-gate dielectric material layer, while other portion of the charge storage layer not being oxidized is converted into a plurality of nanocrystals, wherein the nanocrystals form a floating gate (Emphasis added)

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Applicants submit that such a method as set forth in claim 1 is neither taught, disclosed, nor suggested by Shin, Ueda or any of the other cited references, taken alone or in combination.

Neither Shin, nor Ueda teaches, suggests or discloses a step of "performing a **thermal oxidation process** so that a **portion of the charge storage layer is oxidized to form an inter-gate dielectric material layer, while other portion of the charge storage layer not being oxidized is converted into a plurality of nanocrystals ...**" (Emphasis added).

Shin teaches a step of forming a poly-silicon layer (310) over the tunnel oxide layer (304) (column 3, lines 27-37). Shin also teaches an interlayer dielectric 316 that is alleged to read on the inter-gate dielectric material layer, as set forth in claim 1. However, Shin does not teach that the interlayer dielectric 316 is formed by oxidizing a portion of charge storage layer (item 310 of Shin), as required by the present invention, as set forth in claim 1. On the contrary, the interlayer dielectric 316 is disposed after the nano-crystal is fabricated and after the oxide film 308 is removed. Therefore, Shin fails to teach the step of "performing a **thermal oxidation process** so that a **portion of the charge storage layer is oxidized to form an inter-gate dielectric material layer, while other portion of the charge storage layer not being oxidized is converted into a plurality of nanocrystals ...**" (Emphasis added).

Similar to Shin, Ueda also fails to teach the step of "performing a **thermal oxidation process** so that a **portion of the charge storage layer is oxidized to form an inter-gate**

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dielectric material layer, while other portion of the charge storage layer not being oxidized is converted into a plurality of nanocrystals ..." (Emphasis added). Instead, Ueda teaches forming the nanocrystals 13 first, and a silicon oxide film is further deposited as the control gate insulating film 15 (col. 12, ln. 16-36, Figures 2C-2D). Accordingly, not only Ueda fails to teach performing a thermal oxidation process so that a portion of the charge storage layer is oxidized to form an inter-gate dielectric material layer, Ueda also fails to teach forming an inter-gate dielectric layer and nanocrystals in the same process.

Therefore, even combined, Shin and Ueda, would not render the present invention as set forth in claim 1 a *prima facie* case. MPEP §2143.03

Furthermore, Ueda teaches the spherical nanocrystals 4 are formed from the mixed gas of monosilane gas and helium gas having no oxidizability, which is used as the material gas (column 12, lines 6-15). Therefore, Ueda clearly teaches away from "forming a thermal oxidation process so that ...other portion of the charge storage layer not being oxidized is converted into a plurality of nanocrystals" as set forth in claim 1.

Accordingly, the method, as set forth in claim 1 is submitted to be novel and unobvious over Shin, Ueda, or any of the other cited references, and thus should be allowable.

If independent claim 1 is allowable over the prior art of record, then its dependent claims 2-12 are allowable as a matter of law, because these dependent claims contain all features of their respective independent claim 1. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988).

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CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims 1-12 are in proper condition for allowance and an action to such effect is earnestly solicited. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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Respectfully submitted,

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